

What is claimed is:

- 1 1. A lithographic process for fabricating an article comprising:
2 introducing an image of a pattern into a layer of energy sensitive material formed over a
3 substrate;
4 developing the image to form the first pattern having features of a first size in the energy
5 sensitive material;
6 reducing the size of at least a portion of the developed features having the first size by
7 exposing the features having the first size to a liquid isotropic etchant to form features having a
8 second size; and
9 transferring the pattern with the features having a second size into the underlying
10 substrate.
- 1 2. The process of claim 1 wherein the image is introduced into the energy sensitive resist
2 material by directing radiation onto a lithographic pattern mask thereby projecting an image of
3 the mask pattern into the energy sensitive resist material.
- 4 3. The process of claim 1 wherein the image is introduced into the energy sensitive resist
5 material by directly writing the pattern using a beam of radiation.
- 6 4. The process of claim 1 wherein the energy sensitive material is formed on an anti-
7 reflection coating layer formed over a substrate.
- 8 5. The process of claim 4 wherein the anti-reflection coating is an inorganic anti-
9 reflection coating.
- 1 6. The process of claim 5 wherein the anti-reflection coating is an inorganic dielectric material
2 comprising silicon, oxygen and nitrogen.
- 1 7. The process of claim 5 wherein the anti-reflection coating is formed over the substrate
2 by chemical vapor deposition.
- 1 8. The process of claim 1 wherein the layer of energy sensitive resist material is formed
2 on a layer of polycrystalline silicon formed over the substrate.

1 9. The process of claim 2 wherein the wavelength of the radiation directed onto the mask
2 is selected from x-ray radiation, extreme ultraviolet radiation, 157 nm radiation, 193 nm
3 radiation, deep ultraviolet radiation, I-line radiation and particle beam radiation.

1 10. The process of claim 9 wherein the particle beam radiation is selected from the group
2 consisting of ion beam radiation and electron beam radiation.

1 11. The process of claim 1 wherein the article is a semiconductor device.

1 12. The process of claim 1 wherein the article is an optical device.

1 13. The process of claim 1 wherein the article is a lithographic mask.

1 14. The process of claim 1 wherein the substrate is a semiconductor substrate on which
2 is formed a layer of oxidized silicon.

1 15. The process of claim 1 wherein the energy sensitive resist material is a positive
2 energy sensitive resist material.

1 16. The process of claim 1 further comprising baking the developed pattern before the
2 reducing step.

1 17. The process of claim 16 wherein the developed pattern is baked at a temperature that
2 is below the glass transition temperature of the energy sensitive material.

1 18. The process of claim 5 wherein the anti-reflection coating is a hardmask coating.

1 19. The process of claim 1 wherein the energy sensitive material is formed on a hard-
2 mask coating formed over a substrate.